

otherwise be limited in their range and variable in their type. Natural Selection is as efficient in producing permanence of type in some cases as in accelerating variations in other cases.

If we suppose separation without a difference of external circumstances is a condition sufficient to ensure variation, it renders intelligible the fact that, in nearly allied forms on the same island, the degree of divergence in type is in proportion to the distance in space by which they are separated. The difference between two miles and ten miles makes no change in climate; but it is easy to believe that it is the measure of a corresponding difference in the time of separation. In forms that differ more essentially, the separation may have been as complete and as long-continued in the case of those which now inhabit one valley as in the case of those which are separated by the length of an island. When a wide degree of divergence has been established, hybridation would be precluded. We accordingly find that the difference between species of different genera or subgenera is in most instances equally great whether we take for comparison those from the same or from different valleys.

If, on the other hand, we suppose that a difference in the external conditions is necessary to the evolution of distinct forms, these and other similar facts remain unexplained.

Notes on *Keropia crassirostris*, Gml. ("Piopio").

By THOMAS H. POTTS, Esq., F.L.S.

[Read November 7, 1872.]

IN writing on the natural history of our birds, the bewailment of their lessened numbers has come to be a matter of course. The rapid settlement of the colony, in the case of the Thrush, has limited its range greatly; few birds have retreated with so much haste before the efforts of the cultivator.

Let us take a section of this island, say a hundred miles in width (including Banks's Peninsula) and stretching from the eastern to the western shore; this will afford some information as to its present habitat.

Within this given range at one time the Piopio might be found in any bushy place not too far from water, where belts of shrubs afforded shelter and abundance of seeds; ten years at least have passed since we heard of its occurrence in this neighbourhood

(Governor's Bay on Banks's Peninsula); it is now scarce in the bush-dotted gullies of the Malvern Hills, the Thirteen-mile Bush, Alford Forest, and in many other localities where it was not very uncommon. Let an enthusiastic naturalist now traverse these places in quest of our feathered philosopher, he will find he has become a *rara avis* indeed.

Now we must pass through those portals of the mountains, the river-gorges, to catch sight of the Thrush hopping about the openings in the bush, much after the fashion of his English namesake; but even here its numbers have wofully diminished. Four or five years ago on either side of the Upper Rakaia, where the bushes descend the mountain-slopes, these birds fairly teemed in their favourite haunts; they are already becoming rare. They may be seen about the bushes that skirt the cold streams of the Havelock, the Upper Waimakariri, and the Bealey, through the romantic gorge of the Otira to the more level ground that stretches away to the Teremakau; there it may be frequently heard and seen, always appearing to prefer the timbered forests, the mixed scrub made up of moderate-sized bushes of *Olearia*, *Coriaria*, *Veronica*, and *Coprosma*.

We have now almost reached the western coast. About the Arahura river it was, three years since, most abundant. Last December we searched one of their former favourite haunts (a large island in that river, more or less covered with scrub-bush dotted with ti trees); two or three specimens only were to be seen. They have been driven away from Arahura by the clearances for paddocks to supply the requirements of west-coast cattle-trade.

Last December, in travelling along the coast from Ross to Okarito, we saw this bird in abundance on the face of those bluffs which form such picturesque breaks in that journey; up the river-flats it was equally numerous.

Settlers have given the name of the Thrush to the Piopio, from its size and brown plumage recalling their favourite of the old country: it possesses not in the slightest degree that charm of song which distinguishes the Thrush; yet it enjoys the power of giving utterance to several pleasing notes.

It does not stir so early as many other birds; its morning salute is a long-drawn rather plaintive note; this peculiar whistle it indulges in at times only. Its habit, when close to the water, is to pipe thrice in a way that at once recalls the Red-bill (*Hæmatopus*); the imitation is so like, that the writer and his

son (well acquainted with birds' notes and calls) were frequently deceived, and have looked for a Red-bill till the Piopio disclosed himself by fluttering from bush to bush.

Its common song seems to be near akin to that of the Lark (*Anthus Novæ Zealandiæ*); it sounds two prelude notes, then tinkles off a very brief song. When joyously flying in pursuit of the female, it utters a quick chi, chi, chit, chi, chi, chit. It marks its displeasure, or tries to intimidate intruders that approach its nest with a low purring churr; both cock and hen join in this cry of anger. When singing, the effort is marked by the tail being spread, the wings held not quite close; the feathers of the breast and back are not raised, as in the case of the Bell-bird and some other arboreals.

We have called this Piopio a philosopher; he has quite as good a claim as many a biped to whom that title is accorded. Who doubts this, let him try to have some knowledge of this bird with the thick bill, not merely a know-him-by-sight acquaintance, but such a one as ripens into friendly intimacy; the result will be to know a bird that takes the world as it is, not fanciful as to the kind of food—that feeds with zest on insects when procurable, or can make shift on seeds, fruits, or even grasses—that neither courts nor avoids observation, is as bold as the Robin or Tit, without their intrusiveness—that in the presence of strangers coolly pursues its occupation without the prying of the Brown Creeper or the watchful distrust of the Popoketca—that defends his home with almost the courage of the Falcon or Tern.

It seems to delight in those openings which are found in riverbeds, between long belts of tutu and other scrub; there it may be observed either hopping along the ground or fluttering about the lower sprays of shrubs, flying out to the spits of sand or drifted trees that lie stranded in the river; on some of the larger spits that are becoming clothed with vegetation it searches amongst the burry *Acana*, snips off the fruit-stalks of moss, picking the seeds of some trailing *Veronica*.

Its progress on the ground is usually deliberate; it hops with both feet together, a slight flutter of the wings, a flirt of the tail accompanying each motion. When approached too closely, it leaves its perch by always descending at first, as though safer when near or on the ground; if it would rise on the wing, a momentum is gained by a succession of hops. In some of its habits one is reminded pretty often of the Wattle-bird (*Callæas*). Its

usual associates, at any rate during the summer months, are Tuis, Perroquets, and Cobins; and many a long stretch of river-bed, fragrant with many flowering shrubs, resounds with their varied notes. Not much secretiveness is displayed in the choice of a site for its nest, which may be found at varying distances above the ground, from 4 to 12 feet and upwards, usually at 7 or 8 feet. The structure is firmly and compactly built, with small sprays for the foundation, on which moss is abundantly interwoven with pliant twigs; the lining is usually of fine grass-bents, though some nests are finished off with soft tree-fern down, and are usually placed in Tutu (*Coriaria*), sometimes in *Coprosma* or *Leptospermum*.

Rivals of its own species, as well as other birds, are driven off most resolutely from the neighbourhood of its home.

Probably it breeds twice in the season. Although we have not observed more than two eggs to a nest, yet we have found four eggs tolerably formed in the ovary of a female killed at Christmas-time; the proper complement of eggs is probably four to a nest. The egg is of ovoid, sometimes elongated, form, pure white, spotted with blackish brown or black, purplish at the edges of the spots; sometimes the egg is of a delicate pinkish tinge, just staining the white, spotted with brownish grey, with purplish blotches at the larger end.

From a nest found at Arahura we have an egg that exactly resembles in its colour and marking that of *Oriolus galbula* of Europe. In size this specimen measures through the axis 1 inch $3\frac{1}{2}$ lines, with a diameter of $11\frac{1}{2}$ lines.

From the river Waio, in a nest about 12 feet from the ground, in a bush of *Coriaria*, the eggs, two in number, were of elongated form, and measured in length 1 inch 7 lines, by nearly an inch in width.

December 27th. River Waio; found a nest in a small-leaved *Coprosma* (probably *rhamnoides*), the hen incubating a single egg; she remained on the nest until pushed off; the cock bird was summoned by a jarring call; and both birds joined in a bold defence.

Near Lake Mapourika, in a very swampy situation, we found a nest with the walls very thickly built of moss and Manuka sprays interwoven; it was placed about 15 feet from the ground in a tall Manuka. After looking at scores of nests, the dimensions, we find, average:—across the top, from outside of wall to

outside, about 7 inches; diameter of cavity about 3 inches, with a depth of 2 inches. When the young emerge from the shell, they have a covering of dark brown. We think the eye of the *Piopio* gleams with intelligence; perhaps this notion is conveyed by its narrow but light pale yellow iris; the tongue is pointed, furnished on the inferior side with a strong muscular process of almost horn-like consistence. Both skin and flesh are dark; but the flavour of the bird is not at all bad; it makes a savoury broil for those who bring the proper sauce; when not so provided, they do wanton mischief that kill a bird so harmless and interesting.

We noticed the Thrush flying from the top of a tree after insects, Flycatcher-fashion, in the glow of a hot afternoon.

Ohinatahi.

Descriptions of Buprestidæ collected in Japan by GEORGE LEWIS, Esq. By EDWARD SAUNDERS, F.L.S.

[Read February 20, 1873.]

THE following species of Buprestidæ form part of the large collection of insects made by Mr. George Lewis in Japan. The fauna of that island is so peculiar, that I thought a Table showing the distribution of its genera in other countries would be useful. Such a Table is almost necessarily drawn up from the described species only; but I think that, with the notes I have given, a fairly true idea may be obtained.

	Japan.	China.	Philip- pines.	India, Isles, and Aus- tralia.	Africa.	Europe, &c.	America.
<i>Chrysochroa</i>	1	<u>1</u>	2	30	1	.....	.....
<i>Chrysodema</i>	1	.....	5	24	.....	.....	.....
<i>Chaleophora</i>	2	.....	.....	1	.....	8	9
<i>Buprestis</i>	1	.....	.....	4??	1	19	25
<i>Anthaxia</i>	1	.....	.....	5	10	74	19
<i>Chrysobothris</i>	1	.....	.....	49	8	9	131
<i>Ptosima</i>	1	1	1	1	.....	2	2
<i>Coreëus</i>	2	.....	1	19	.....	5	.....
<i>Sambus</i>	1	.....	.....	12	1	.....	.....
<i>Cryptodactylus</i>	1	.....	.....	3	.....	.....	.....
<i>Agrilus</i>	11	1*	1	141 ₆	32	65 ₅	162†
<i>Cylindromorphus</i>	1	.....	.....	.....	.....	7	.....
<i>Trachys</i>	11	1	.....	45	13	13	.....
<i>Paratrachys</i>	1	.....	.....	*	.....	.....	.....

* An undescribed species.

† About as many again still undescribed.